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Polyelectrolytes Exceeding ITO Flexibility in Electrochromic Devices

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Supporting Information

Table S1. The optimum salt concentrations for each Gel Polymer Electrolyte (GPE), under 1 to 1 PC to PEG ratio, and their corresponding optimal ionic conductivities.

PEGDMA in PEG (wt%)	Optimal Salt (wt%)	Ionic conductivity (mS/cm)
100	9.1	0.374
75	9.1	0.476
50	9.1	0.614
25	9.1	0.824
10	9.1	0.855
5	9.1	0.872
2.5	9.1	0.904
1	9.1	0.907
0	9.1	0.914

Table S2. The optimum ionic conductivity, glass transition temperature, and flexibility for each GPE studied across different solvent to PEG ratios. The total mass of solvent and PEG was kept constant and the amount of PEGDMA was fixed at 25% in PEG.

PC to PEG ratio	Optimal Ionic Conductivity (S/cm)	Glass transition Temperature (°C)	Sustainable minimum bending radius of curvature (mm)
0 : 1	1.24×10^{-05}	-48	8
3 : 7	1.70×10^{-04}	-65	7
2: 3	3.96×10^{-04}	-74	6.25
1: 1	8.24×10^{-04}	-79	5.5
3 : 2	1.36×10^{-03}	-84	5

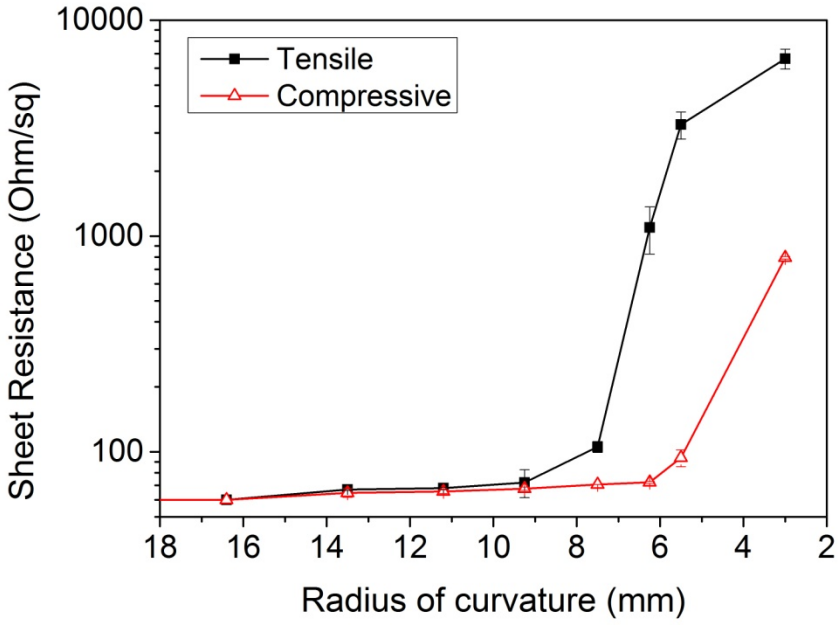

Fig. S1. Sheet resistances of Sample B ITO/PET as a function of bending radius of curvature under tensile (solid black squares) and compressive (open red triangles) stress after 100 bending cycles.

Under tensile stress, when the radius of curvature reached 11 mm, there was a slight increase in the sheet resistance value. When the radius of curvature reached 9.25 mm, the sheet resistance value increased to 72 Ohms/sq. Upon further radius of curvature decrease, to 7.5 mm, there was a much more obvious increase in the sheet resistance value. It increased from 60 to 105 Ohms/sq. Under compressive bending mode, there was not an obvious sheet resistance change until the bending radius dropped to 5.5 mm (sheet resistance increased from 60 to 93 Ohms/sq).

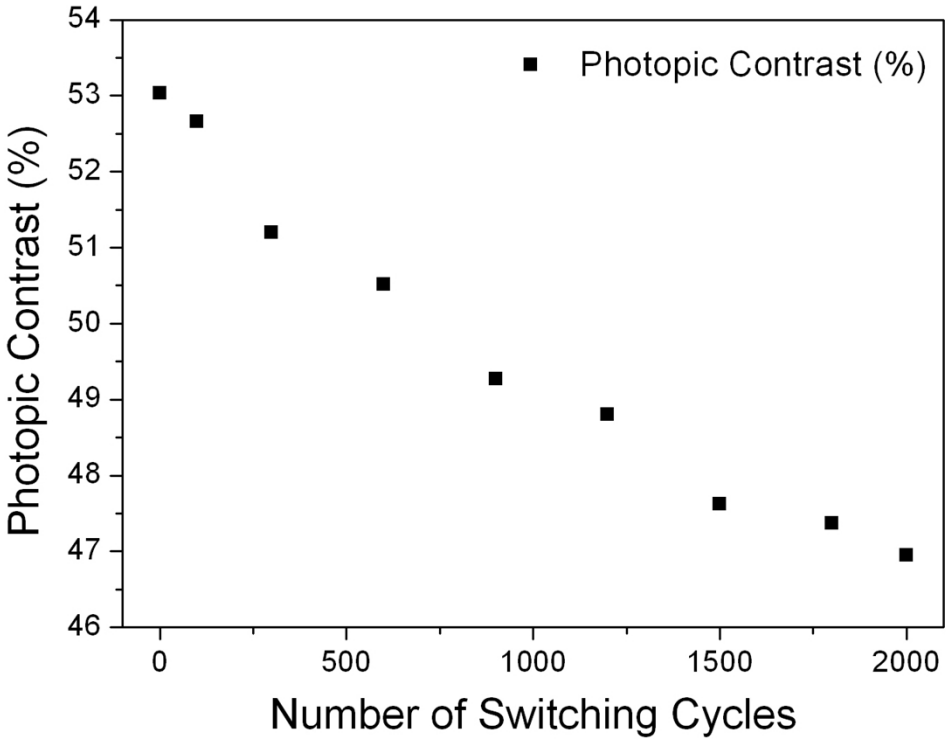

Figure S2. Stability plot of a flexible electrochromic device using the optimum Gel Polymer Electrolyte (GPE) exhibiting a 6% decrease in photopic contrast over 2000 cycles (4000 switches).